

Figure 1

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material : P- Bulk Silicon
	Oxidation (Initial oxide)
	Photo
	N-Type Implant (N-Well)
	Diffusion
Mask 2: Active Area	Oxide Etch
	Oxidation (Subnitox)
	Silicon Nitride Deposition (CVD)
	Photo
	Nitride Etch
Mask 3: P-Field	Photo
	P-Type Implant (P-Field)
	Blanket N-Type Implant (N-Field)
	Oxidation (Field Oxide)
	Nitride Etch
	Oxide Etch
	Oxidation (Pre-Gate Oxide)
	Oxide Etch
Mask 5: VTP Adjust	Oxidation (Gate Oxide)
	Photo
	P-Type Implant (VTP Adjust)
Mask 6: Polysilicon Gate Patterning	Polysilicon Gate Deposition (CVD)
	Polysilicon Doping
	Photo
	Polysilicon Etch
Mask 10: N+ Implant	Oxidation and Diffusion
	Polysilicon Oxidation
	Photo
	N-Type Implant (N+)
Mask 11: P+ Implant	Photo
	P-Type Implant (P+)
Mask 12: Contacts	SG/PSG/SG (Oxide) Deposition
	Diffusion
	Photo
	Contact Etch
Mask 13: Metal 1	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
	Dielectric and SOG (Oxide) Deposition
Mask 14: Vias	Photo
	Vias Etch
Mask 15: Metal 2	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
Mask 16: Passivation	Oxide / Nitride Deposition
	Photo
	Oxide Etch

Figure 2

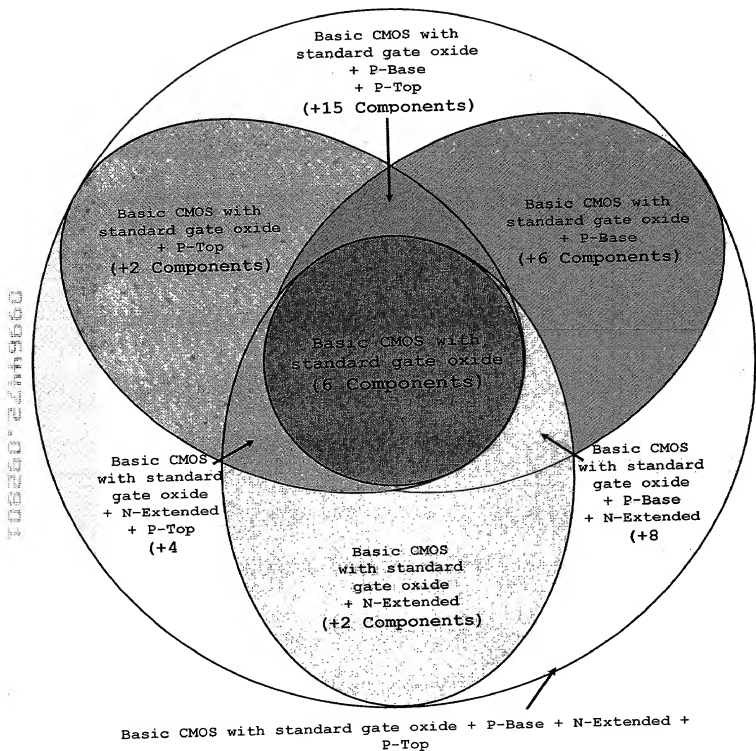


Figure 3

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material P- Bulk Silicon
	Oxidation (Initial oxide)
	Photo
	N-Type Implant (N-Well)
	Diffusion
Mask 2: Active Area	Oxide Etch
	Oxidation (Subnitox)
	Silicon Nitride Deposition (CVD)
	Photo
	Nitride Etch
Mask 3: P-Field	Photo
	P-Type Implant (P-Field)
	Blanket N-Type Implant (N-Field)
	Oxidation (Field Oxide)
	Nitride Etch
Mask 5: Thin Gate oxide & VTP Adjust	Oxide Etch
	Oxidation (Thin Gate Oxide)
	Photo
	P-Type Implant (VTP Adjust)
	Polysilicon Gate Deposition (CVD)
Mask 6: Polysilicon Gate Patterning	Polysilicon Doping
	Photo
	Polysilicon Etch
	Photo
	N-Type Implant (N-Extended)
Mask 10: N+ Implant	Oxidation and Diffusion
	Polysilicon Oxidation
	Photo
	N-Type Implant (N+)
	Photo
Mask 11: P+ Implant	P-Type Implant (P+)
	SG/PSG/SOG (Oxide) Deposition
	Diffusion
	Photo
	Contact Etch
Mask 13: Metal 1	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
	Dielectric and SOG (Oxide) Deposition
Mask 14: Vias	Photo
	Vias Etch
	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
Mask 15: Metal 2	Metal Etch
	Oxide / Nitride Deposition
	Photo
	Oxide Etch
	Photo
Mask 16: Passivation	Oxide Etch
	Photo
	Oxide Etch
	Photo
	Oxide Etch

Figure 4

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material - P- Bulk Silicon
	Oxidation (Initial oxide)
	Photo
	N-Type Implant (N-Well)
	Diffusion
Mask 2: Active Area	Oxide Etch
	Oxidation (Subnitox)
	Silicon Nitride Deposition (CVD)
	Photo
	Nitride Etch
Mask 3: P-Field	Photo
	P-Type Implant (P-Field)
	Blanket N-Type Implant (N-Field)
	Oxidation (Field Oxide)
	Nitride Etch
	Oxide Etch
	Oxidation (Pre-Gate Oxide)
Mask 5: Thin Gate oxide & VTP Adjust	Oxide Etch
	Oxidation (Thin Gate Oxide)
	Photo
	P-Type Implant (VTP Adjust)
Mask 6: Polysilicon Gate Patterning	Polysilicon Gate Deposition (CVD)
	Polysilicon Doping
	Photo
	Polysilicon Etch
Mask 9: P-Top	Photo
	P-Type Implant (P-Top)
Mask 10: N+ Implant	Oxidation and Diffusion
	Polysilicon Oxidation
	Photo
	N-Type Implant (N+)
	Photo
Mask 11: P+ Implant	P-Type Implant (P+)
Mask 12: Contacts	SG/PSG/SOG (Oxide) Deposition
	Diffusion
	Photo
	Contact Etch
Mask 13: Metal 1	Ti/TiN Deposition with Oxidation
	Aluminum Alloy Deposition
	Photo
	Metal Etch
	Dielectric and SOG (Oxide) Deposition
Mask 14: Vias	Photo
	Vias Etch
Mask 15: Metal 2	Ti/TiN Deposition with Oxidation
	Aluminum Alloy Deposition
	Photo
	Metal Etch
	Oxide / Nitride Deposition
Mask 16: Passivation	Photo
	Oxide Etch

Figure 5

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material : P- Bulk Silicon Oxidation (Initial oxide) Photo N-Type Implant (N-Well) Diffusion
Mask 2: Active Area	Oxide Etch Oxidation (Subnitox) Silicon Nitride Deposition (CVD) Photo Nitride Etch
Mask 3: P-Field	Photo P-Type Implant (P-Field) Blanket N-Type Implant (N-Field) Oxidation (Field Oxide) Nitride Etch Oxide Etch Oxidation (Pre-Gate Oxide) Oxide Etch Oxidation (Thin Gate Oxide) Photo P-Type Implant (VTF Adjust)
Mask 5: Thin Gate oxide & VTF Adjust	Polysilicon Gate Deposition (CVD) Polysilicon Doping Photo Polysilicon Etch
Mask 6: Polysilicon Gate Patterning	Photo N-Type Implant (N-Extended) Photo P-Type Implant (P-Top) Oxidation and Diffusion Polysilicon Oxidation Photo N-Type Implant (N+) Photo P-Type Implant (P+) SG/PSG/SOG (Oxide) Deposition Diffusion Photo Contact Etch Ti/TiN Deposition with Oxidation Aluminium Alloy Deposition Photo Metal Etch Dielectric and SOG (Oxide) Deposition Photo Vias Etch
Mask 8: N-Extended	
Mask 9: P-Top	
Mask 10: N+ Implant	
Mask 11: P+ Implant	
Mask 12: Contacts	
Mask 13: Metal 1	
Mask 14: Vias	
Mask 15: Metal 2	
Mask 16: Passivation	Oxide / Nitride Deposition Photo Oxide Etch

Figure 6

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material : P- Bulk Silicon
	Oxidation (Initial oxide)
	Photo
	N-Type Implant (N-Well)
	Diffusion
Mask 2: Active Area	Oxide Etch
	Oxidation (Subnitox)
	Silicon Nitride Deposition (CVD)
	Photo
	Nitride Etch
Mask 3: P-Field	Photo
	P-Type Implant (P-Field)
	Blanket N-Type Implant (N-Field)
	Oxidation (Field Oxide)
	Nitride Etch
Mask 5: Thin Gate oxide & VTP Adjust	Oxide Etch
	Oxidation (Pre-Gate Oxide)
	Oxide Etch
	Oxidation (Thin Gate Oxide)
	Photo
Mask 6: Polysilicon Gate Patterning	P-Type Implant (VTP Adjust)
	Polysilicon Gate Deposition (CVD)
	Polysilicon Doping
	Photo
	Polysilicon Etch
Mask 7: P-Base	Photo
Mask 10: N+ Implant	P-Type Implant (P-Base)
	Oxidation and Diffusion
	Polysilicon Oxidation
	Photo
	N-Type Implant (N+)
Mask 11: P+ Implant	Photo
	P-Type Implant (P+)
	SG/PSG/SGO (Oxide) Deposition
	Diffusion
	Photo
Mask 12: Contacts	Contact Etch
	Ti/TiN Deposition with Oxidation
	Aluminum Alloy Deposition
	Photo
	Metal Etch
Mask 13: Metal 1	Dielectric and SOG (Oxide) Deposition
	Photo
	Vias Etch
	Ti/TiN Deposition with Oxidation
	Aluminum Alloy Deposition
Mask 14: Vias	Photo
	Metal Etch
	Oxide / Nitride Deposition
	Photo
	Oxide Etch
Mask 15: Metal 2	
Mask 16: Passivation	

Figure 7

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material : P- Bulk Silicon Oxidation (Initial oxide) Photo N-Type Implant (N-Well) Diffusion
Mask 2: Active Area	Oxide Etch Oxidation (Subnitox) Silicon Nitride Deposition (CVD) Photo Nitride Etch
Mask 3: P-Field	Photo P-Type Implant (P-Field) Blanket N-Type Implant (N-Field) Oxidation (Field Oxide) Nitride Etch Oxide Etch Oxidation (Pre-Gate Oxide) Oxide Etch Oxidation (Thin Gate Oxide) Photo P-Type Implant (VTP Adjust)
Mask 5: Thin Gate oxide & VTP Adjust	Polysilicon Gate Deposition (CVD) Polysilicon Doping Photo Polysilicon Etch
Mask 6: Polysilicon Gate Patterning	Photo P-Type Implant (P Base) Photo N-Type Implant (N-Extended) Oxidation and Diffusion Polysilicon Oxidation Photo N-Type Implant (N+) Photo P-Type Implant (P+) SG/PSG/SOG (Oxide) Deposition Diffusion Photo Contact Etch Ti/TiN Deposition with Oxidation Aluminium Alloy Deposition Photo Metal Etch Dielectric and SOG (Oxide) Deposition Photo Vias Etch Ti/TiN Deposition with Oxidation Aluminium Alloy Deposition Photo Metal Etch Oxide / Nitride Deposition Photo Oxide Etch
Mask 7: P-Base	
Mask 8: N-Extended	
Mask 10: N+ Implant	
Mask 11: P+ Implant	
Mask 12: Contacts	
Mask 13: Metal 1	
Mask 14: Vias	
Mask 15: Metal 2	
Mask 16: Passivation	

Figure 8

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material - P- Bulk Silicon
	Oxidation (Initial oxide)
	Photo
	N-Type Implant (N-Well)
	Diffusion
Mask 2: Active Area	Oxide Etch
	Oxidation (Subnitox)
	Silicon Nitride Deposition (CVD)
	Photo
Mask 3: P-Field	Nitride Etch
	Photo
	P-Type Implant (P-Field)
	Blanket N-Type Implant (N-Field)
	Oxidation (Field Oxide)
	Nitride Etch
	Oxide Etch
Mask 5: Thin Gate oxide & VTP Adjust	Oxidation (Pre-Gate Oxide)
	Oxide Etch
	Oxidation (Thin Gate Oxide)
	Photo
Mask 6: Polysilicon Gate Patterning	P-Type Implant (VTP Adjust)
	Polysilicon Gate Deposition (CVD)
	Polysilicon Doping
	Photo
	Polysilicon Etch
Mask 7: P-Base	Photo
	P-Type Implant (P-Base)
Mask 9: P-Top	Photo
	P-Type Implant (P-Top)
Mask 10: N+ Implant	Oxidation and Diffusion
	Polysilicon Oxidation
	Photo
	N-Type Implant (N+)
Mask 11: P+ Implant	Photo
	P-Type Implant (P+)
Mask 12: Contacts	SG/PSG/SGG (Oxide) Deposition
	Diffusion
	Photo
	Contact Etch
Mask 13: Metal 1	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
Mask 14: Vias	Dielectric and SGG (Oxide) Deposition
	Photo
	Vias Etch
Mask 15: Metal 2	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
Mask 16: Passivation	Oxide / Nitride Deposition
	Photo
	Oxide Etch

Figure 9

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material : P-Bulk Silicon Oxidation (Initial oxide) Photo N-Type Implant (N-Well) Diffusion
Mask 2: Active Area	Oxide Etch Oxidation (Subnitox) Silicon Nitride Deposition (CVD) Photo Nitride Etch
Mask 3: P-Field	Photo P-Type Implant (P-Field) Blanket N-Type Implant (N-Field) Oxidation (Field Oxide) Nitride Etch Oxide Etch Oxidation (Pre-Gate Oxide) Oxide Etch Oxidation (Thin Gate Oxide) Photo P-Type Implant (VTP Adjust)
Mask 5: Thin Gate oxide & VTP Adjust	Polysilicon Gate Deposition (CVD) Polysilicon Doping Photo Polysilicon Etch
Mask 6: Polysilicon Gate Patterning	Photo P-Type Implant (P-Base)
Mask 7: P-Base	Photo N-Type Implant (N-Extended)
Mask 8: N-Extended	Photo P-Type Implant (P-Top)
Mask 9: P-Top	Oxidation and Diffusion Polysilicon Oxidation Photo N-Type Implant (N+)
Mask 10: N+ Implant	Photo P-Type Implant (P+)
Mask 11: P+ Implant	SG/PSG/SOG (Oxide) Deposition Diffusion Photo Contact Etch
Mask 12: Contacts	Ti/TiN Deposition with Oxidation Aluminium Alloy Deposition Photo Metal Etch Dielectric and SOG (Oxide) Deposition
Mask 13: Metal 1	Photo Vias Etch
Mask 14: Vias	Ti/TiN Deposition with Oxidation Aluminium Alloy Deposition Photo Metal Etch Oxide / Nitride Deposition
Mask 15: Metal 2	Photo Oxide Etch
Mask 16: Passivation	

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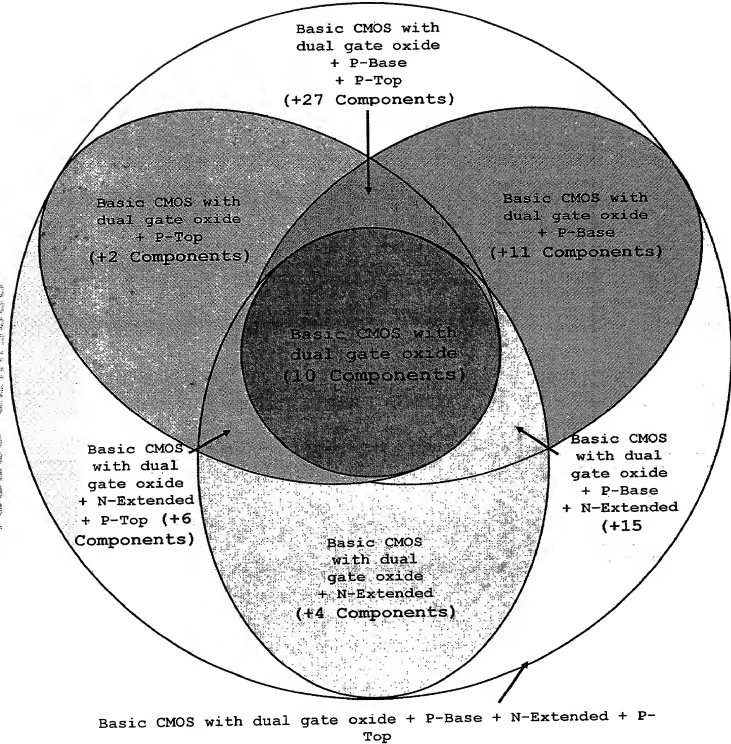


Figure 12

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material : P- Bulk Silicon
	Oxidation (Initial oxide)
	Photo
	N-Type Implant (N-Well)
	Diffusion
Mask 2: Active Area	Oxide Etch
	Oxidation (Subnitox)
	Silicon Nitride Deposition (CVD)
	Photo
	Nitride Etch
Mask 3: P-Field	Photo
	P-Type Implant (P-Field)
	Blanket N-Type Implant (N-Field)
	Oxidation (Field Oxide)
	Nitride Etch
	Oxide Etch
	Oxidation (Pre-Gate Oxide)
Mask 4: High-voltage Gate Oxide	Oxide Etch
	Oxidation (High-voltage Gate Oxide)
Mask 5: Thin Gate oxide & VTP Adjust	Photo
	Oxide Etch
	Oxidation (Thin Gate Oxide)
	Photo
	P-Type Implant (VTP Adjust)
Mask 6: Polysilicon Gate Patterning	Polysilicon Gate Deposition (CVD)
	Polysilicon Doping
	Photo
	Polysilicon Etch
Mask 7: P-Top	Photo
	P-Type Implant (P-Top)
Mask 10: N+ Implant	Oxidation and Diffusion
	Polysilicon Oxidation
	Photo
	N-Type Implant (N+)
Mask 11: P+ Implant	Photo
	P-Type Implant (P+)
Mask 12: Contacts	SG/PSG/SOG (Oxide) Deposition
	Diffusion
	Photo
	Contact Etch
Mask 13: Metal 1	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
	Dielectric and SOG (Oxide) Deposition
Mask 14: Vias	Photo
	Vias Etch
Mask 15: Metal 2	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
	Oxide / Nitride Deposition
Mask 16: Passivation	Photo
	Oxide Etch

Figure 13

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material : P- Bulk Silicon
	Oxidation (Initial oxide)
	Photo
	N-Type Implant (N-Well)
	Diffusion
Mask 2: Active Area	Oxide Etch
	Oxidation (Subnitox)
	Silicon Nitride Deposition (CVD)
	Photo
	Nitride Etch
Mask 3: P-Field	Photo
	P-Type Implant (P-Field)
	Blanket N-Type Implant (N-Field)
	Oxidation (Field Oxide)
	Nitride Etch
	Oxide Etch
	Oxidation (Pre-Gate Oxide)
Mask 4: High-voltage Gate Oxide	Oxide Etch
	Oxidation (High-voltage Gate Oxide)
	Photo
Mask 5: Thin Gate oxide & VTP Adjust	Oxide Etch
	Oxidation (Thin Gate Oxide)
	Photo
	P-Type Implant (VTP Adjust)
Mask 6: Polysilicon Gate Patterning	Polysilicon Gate Deposition (CVD)
	Polysilicon Doping
	Photo
	Polysilicon Etch
Mask 8: N-Extended	Photo
Mask 10: N+ Implant	N-Type Implant (N-Extended)
	Oxidation and Diffusion
	Polysilicon Oxidation
	Photo
Mask 11: P+ Implant	N-Type Implant (N+)
	Photo
	P-Type Implant (P+)
Mask 12: Contacts	SG/PSG/SOG (Oxide) Deposition
	Diffusion
	Photo
	Contact Etch
Mask 13: Metal 1	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
Mask 14: Vias	Dielectric and SOG (Oxide) Deposition
	Photo
	Vias Etch
Mask 15: Metal 2	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
Mask 16: Passivation	Oxide / Nitride Deposition
	Photo
	Oxide Etch

Figure 14

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material - P- Bulk Silicon
	Oxidation (Initial oxide)
	Photo
	N-Type Implant (N-Well)
	Diffusion
Mask 2: Active Area	Oxide Etch
	Oxidation (Subnitox)
	Silicon Nitride Deposition (CVD)
	Photo
	Nitride Etch
Mask 3: P-Field	Photo
	P-Type Implant (P-Field)
	Blanket N-Type Implant (N-Field)
	Oxidation (Field Oxide)
	Nitride Etch
	Oxide Etch
	Oxidation (Pre-Gate Oxide)
Mask 4: High-voltage Gate Oxide	Oxide Etch
	Oxidation (High-voltage Gate Oxide)
Mask 5: Thin Gate oxide & VTP Adjust	Photo
	Oxide Etch
	Oxidation (Thin Gate Oxide)
	Photo
	P-Type Implant (VTP Adjust)
Mask 6: Polysilicon Gate Patterning	Polysilicon Gate Deposition (CVD)
	Polysilicon Doping
	Photo
	Polysilicon Etch
Mask 8: N-Extended	Photo
	N-Type Implant (N-Extended)
Mask 9: P-Top	Photo
	P-Type Implant (P-Top)
Mask 10: N+ Implant	Oxidation and Diffusion
	Polysilicon Oxidation
	Photo
	N-Type Implant (N+)
Mask 11: P+ Implant	Photo
	P-Type Implant (P+)
Mask 12: Contacts	SG/PSG/SOG (Oxide) Deposition
	Diffusion
	Photo
	Contact Etch
Mask 13: Metal 1	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
	Dielectric and SOG (Oxide) Deposition
Mask 14: Vias	Photo
	Vias Etch
Mask 15: Metal 2	Ti/TiN Deposition with Oxidation
	Aluminium Alloy Deposition
	Photo
	Metal Etch
	Oxide / Nitride Deposition
Mask 16: Passivation	Photo
	Oxide Etch

Figure 16

Name of Photolithographic Mask	Process Steps
Mask 1: N-Well	Starting Material : P- Bulk Silicon Oxidation (Initial oxide) Photo N-Type Implant (N-Well) Diffusion
Mask 2: Active Area	Oxide Etch Oxidation (Subnitox) Silicon Nitride Deposition (CVD) Photo Nitride Etch
Mask 3: P-Field	Photo P-Type Implant (P-Field) Blanket N-Type Implant (N-Field) Oxidation (Field Oxide) Nitride Etch Oxide Etch Oxidation (Pre-Gate Oxide)
Mask 4: High-voltage Gate Oxide	Oxide Etch Oxidation (High-voltage Gate Oxide) Photo
Mask 5: Thin Gate oxide & VTP Adjust	Oxide Etch Oxidation (Thin Gate Oxide) Photo P-Type Implant (VTP Adjust)
Mask 6: Polysilicon Gate Patterning	Polysilicon Gate Deposition (CVD) Polysilicon Doping Photo Polysilicon Etch
Mask 7: P-Base	Photo P-Type Implant (P-Base)
Mask 8: N-Extended	Photo N-Type Implant (N-extended)
Mask 10: N+ Implant	Oxidation and Diffusion Polysilicon Oxidation Photo N-Type Implant (N+)
Mask 11: P+ Implant	Photo P-Type Implant (P+)
Mask 12: Contacts	SG/PSG/SOG (Oxide) Deposition Diffusion Photo Contact Etch
Mask 13: Metal 1	Ti/TiN Deposition with Oxidation Aluminum Alloy Deposition Photo Metal Etch
Mask 14: Vias	Dielectric and SOG (Oxide) Deposition Photo Vias Etch
Mask 15: Metal 2	Ti/TiN Deposition with Oxidation Aluminum Alloy Deposition Photo Metal Etch
Mask 16: Passivation	Oxide / Nitride Deposition Photo Oxide Etch

Figure 19a

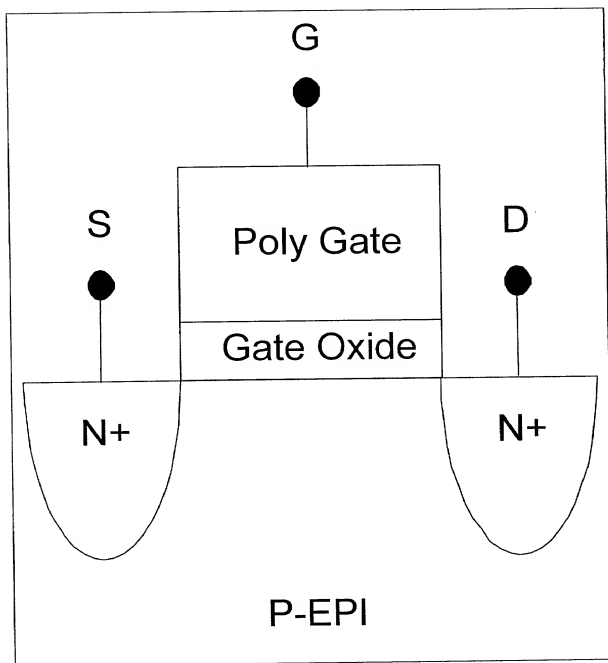


Figure 19b

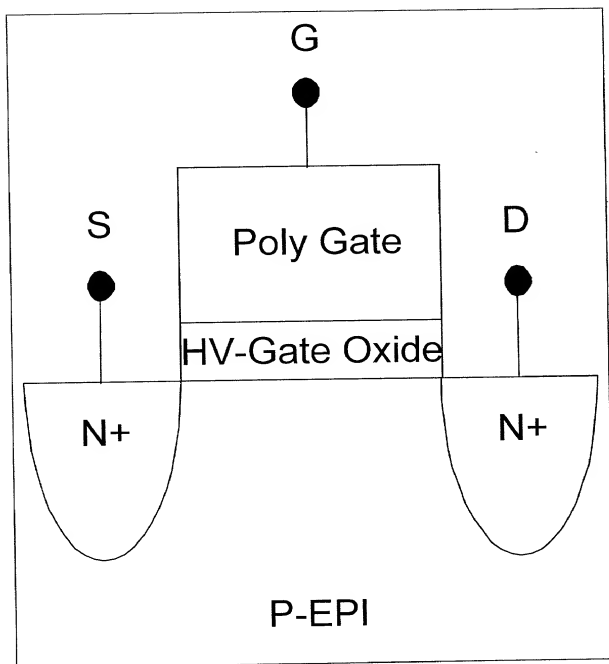


Figure 20a

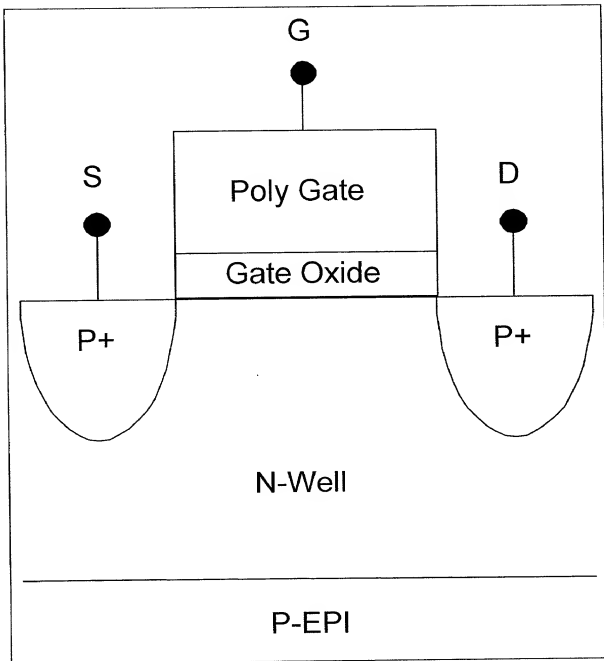


Figure 20b

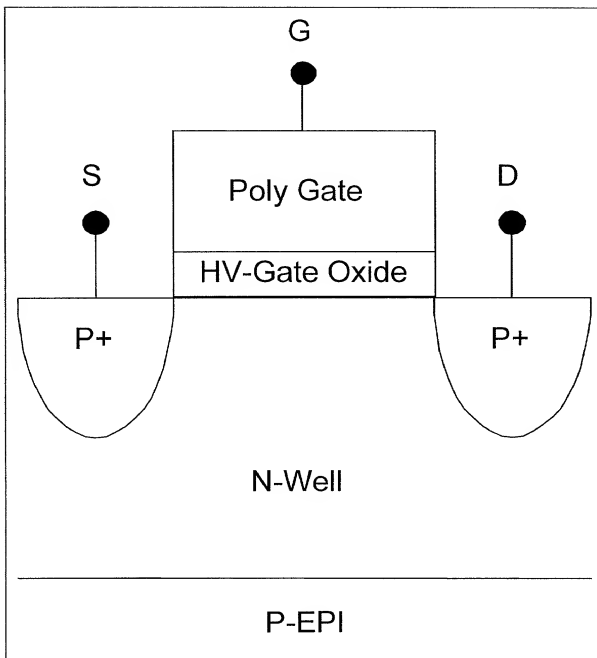


Figure 21a

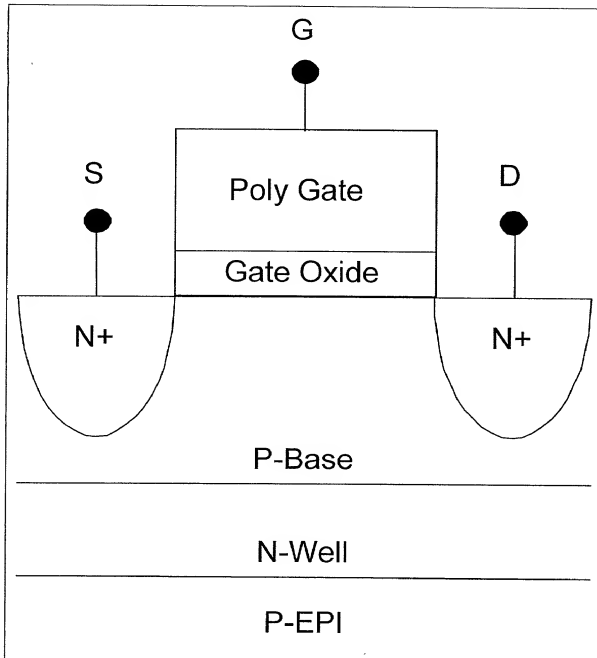


Figure 21b

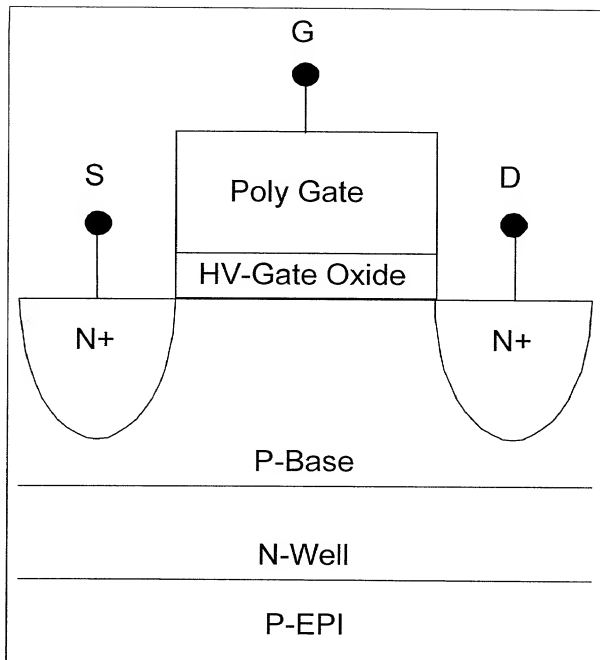


Figure 22a

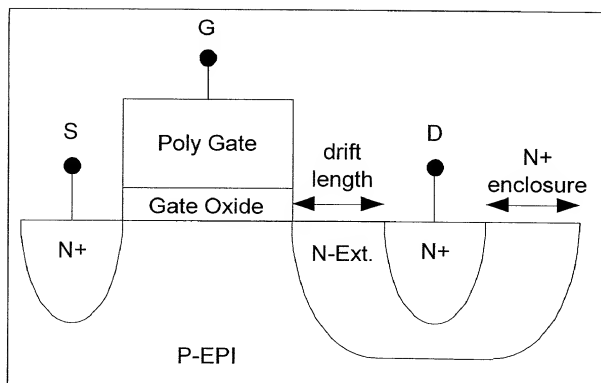


Figure 22b

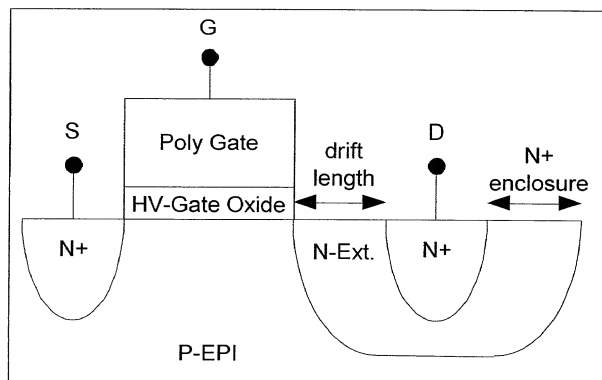


Figure 23a

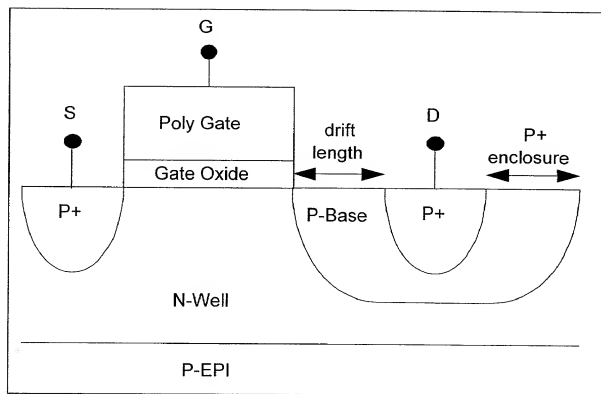


Figure 23b

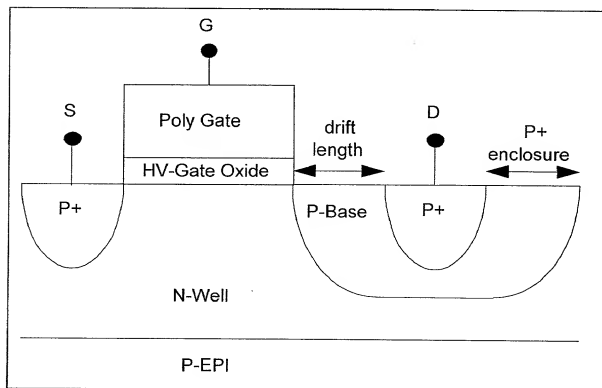


Figure 24a

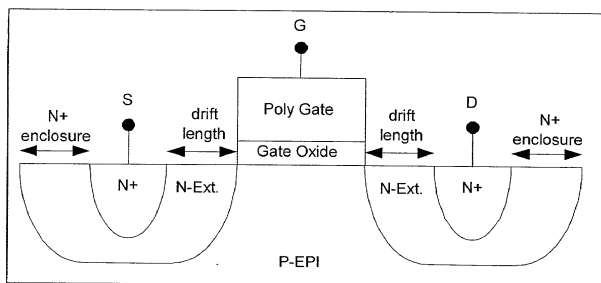


Figure 24b

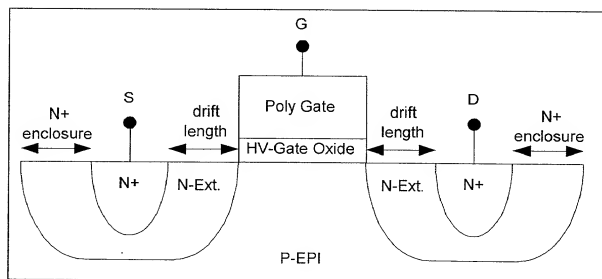


Figure 25a

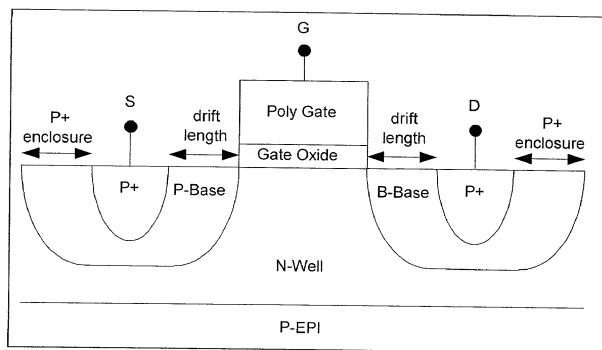


Figure 25b

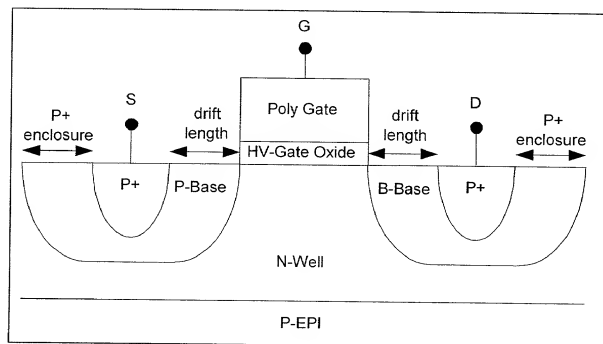


Figure 26a

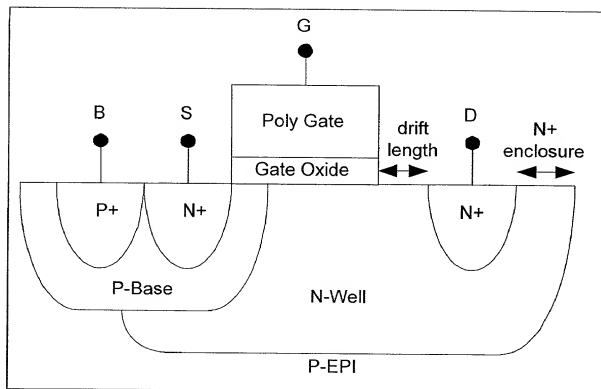


Figure 26b

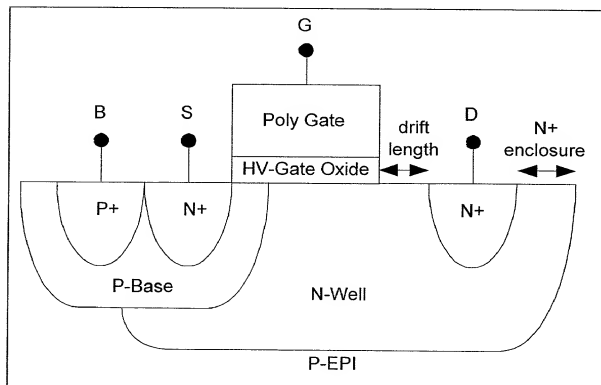


Figure 27a

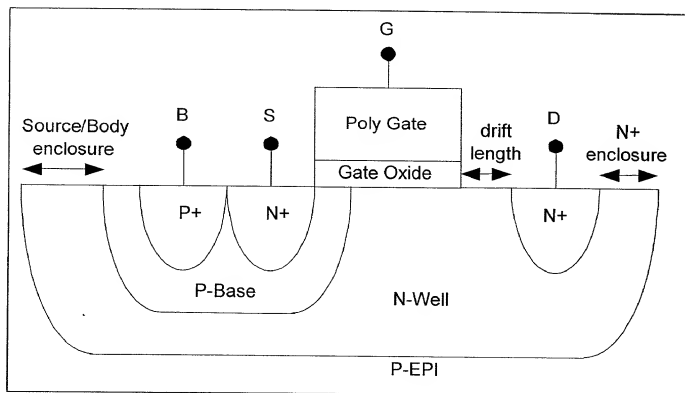


Figure 27b

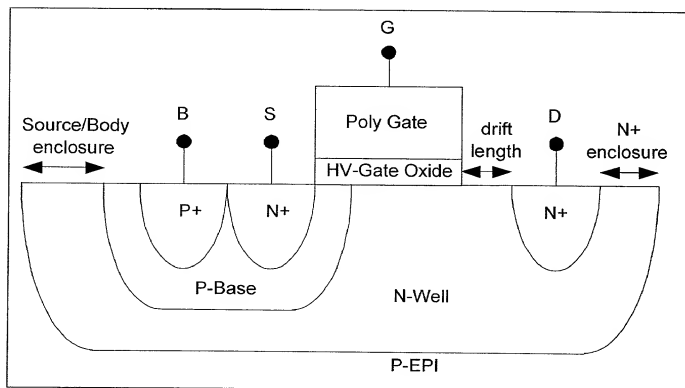


Figure 28a

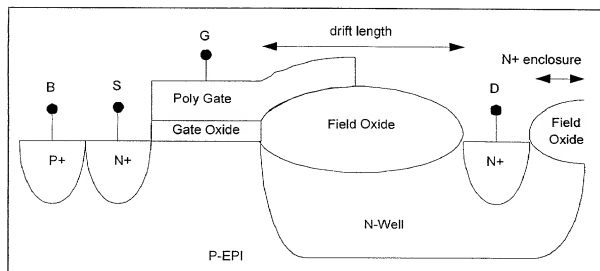


Figure 28b

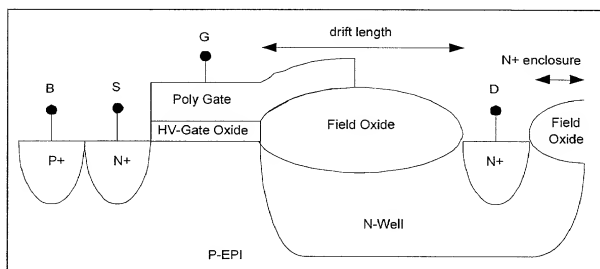


Figure 29a

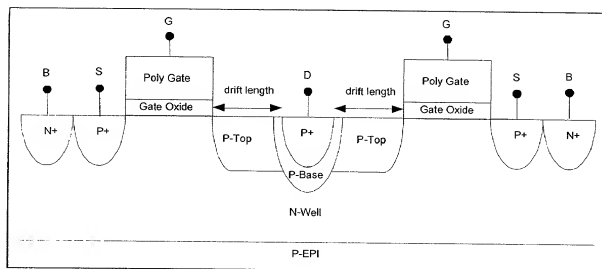


Figure 29b

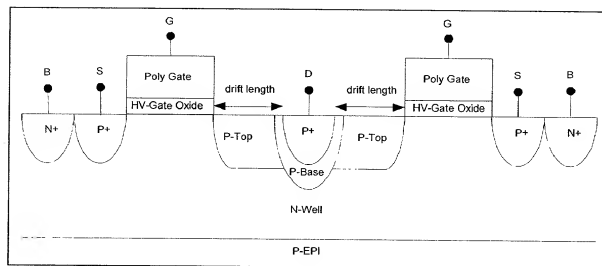


Figure 30a

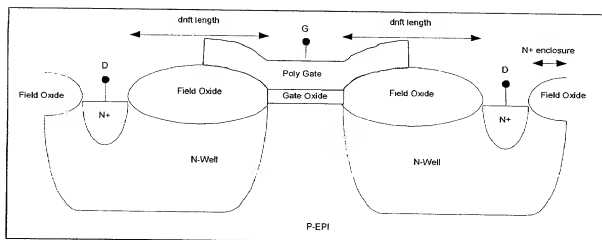


Figure 30b

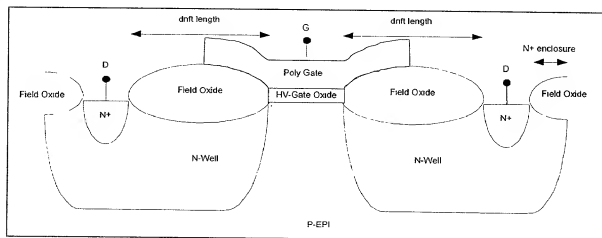


Figure 31a

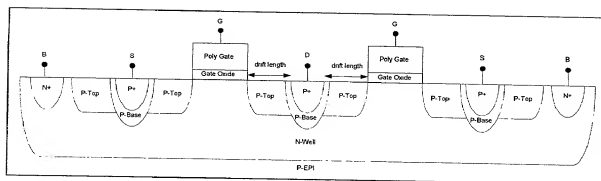


Figure 31b

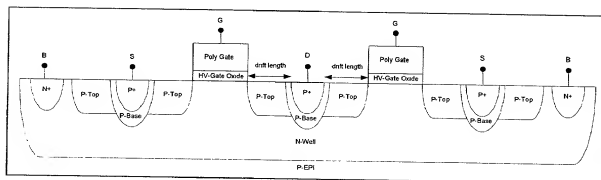


Figure 32a

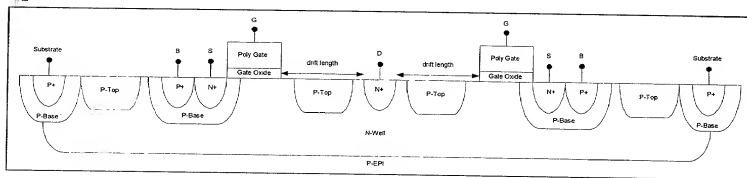


Figure 32b

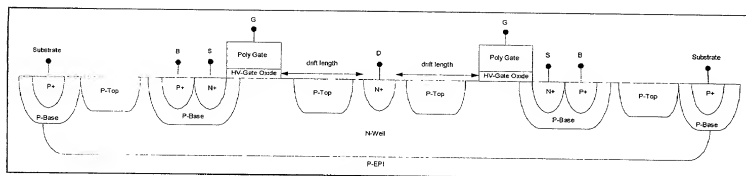


Figure 33a

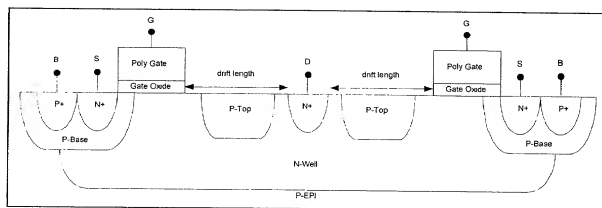


Figure 33b

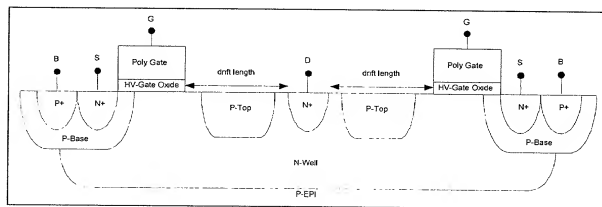


Figure 34a

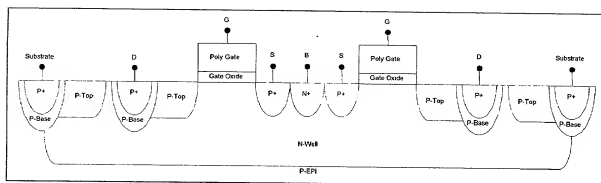


Figure 34b

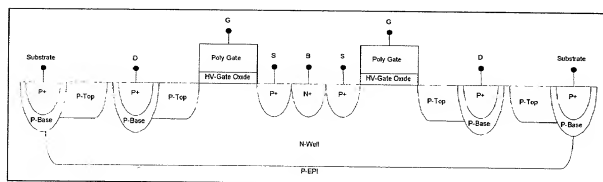
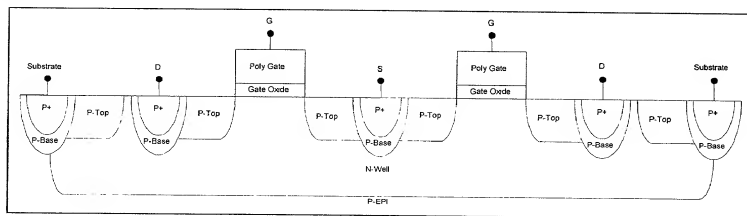


Figure 35a



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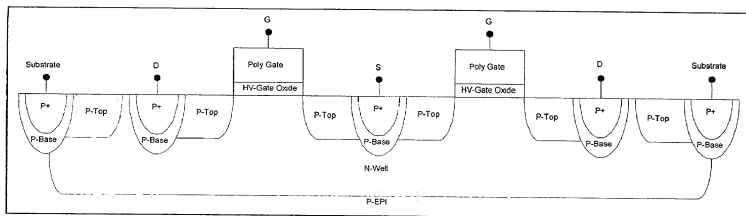


Figure 36

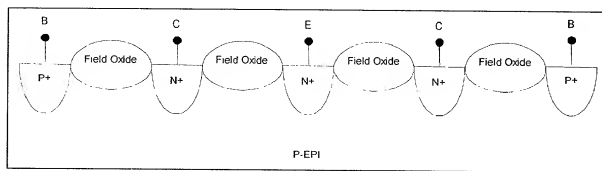


Figure 37

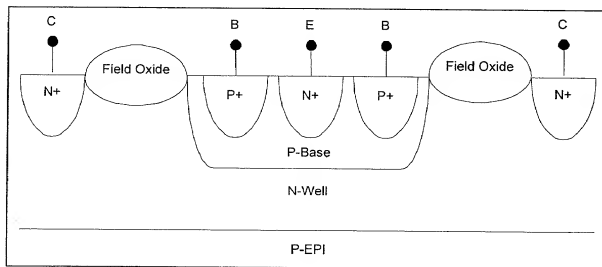


Figure 40

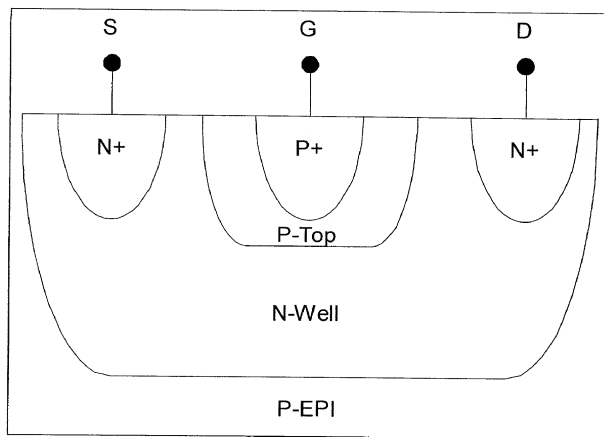


Figure 41a

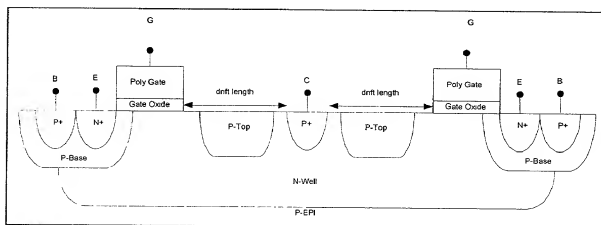
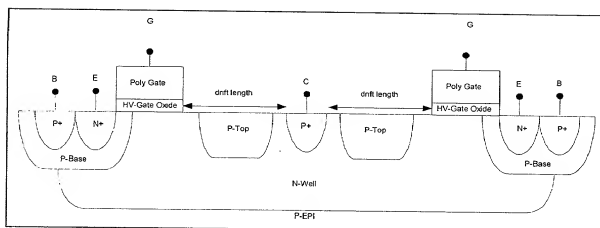


Figure 41b



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Figure 42

Active Component	Maximum Gate Voltage (V)	Maximum Drain Voltage (V)
The standard N-MOSFET of Figure 19a	15	5.5
The standard N-MOSFET of Figure 19b	40	5.5
The standard P-MOSFET of Figure 20a	15	5.5
The standard P-MOSFET of Figure 20b	40	5.5
The standard Junction isolated N-MOSFET of Figure 21a	15	5.5
The standard Junction isolated N-MOSFET of Figure 21b	40	5.5
The mid-voltage single extended N-MOSFET of Figure 22a	15	40
The mid-voltage single extended N-MOSFET of Figure 22b	40	40
The mid-voltage single extended P-MOSFET of Figure 23a	15	40
The mid-voltage single extended P-MOSFET of Figure 23b	40	40
The mid-voltage double extended N-MOSFET of Figure 24a	15	40
The mid-voltage double extended N-MOSFET of Figure 24b	40	40
The mid-voltage double extended P-MOSFET of Figure 25a	15	40
The mid-voltage double extended P-MOSFET of Figure 25b	40	40
The mid-voltage single extended N-LDMOSFET of Figure 26a	15	75
The mid-voltage single extended N-LDMOSFET of Figure 26b	40	75
The mid-voltage floating source N-LDMOSFET of Figure 27a	15	75
The mid-voltage floating source N-LDMOSFET of Figure 27b	40	75
The high-voltage single extended N-MOSFET of Figure 28a	15	
100		
The high-voltage single extended N-MOSFET of Figure 28b	40	
100		
The high-voltage single extended P-MOSFET of Figure 29a	15	
100		
The high-voltage single extended P-MOSFET of Figure 29b	40	
100		
The high-voltage double extended N-MOSFET of Figure 30a	15	
100		
The high-voltage double extended N-MOSFET of Figure 30b	40	
100		
The high-voltage double extended P-MOSFET of Figure 31a	15	
100		
The high-voltage double extended P-MOSFET of Figure 31b	40	
100		
The high-voltage double extended N-LDMOSFET of Figure 32a	15	
325		
The high-voltage double extended N-LDMOSFET of Figure 32b	40	
325		
The very-high-voltage single extended N-LDMOSFET of Figure 33a	15	
600		
The very-high-voltage single extended N-LDMOSFET of Figure 33b	40	
600		
The very-high-voltage single extended P-MOSFET of Figure 34a	15	
325		
The very-high-voltage single extended P-MOSFET of Figure 34b	40	
325		
The very-high-voltage double extended P-MOSFET of Figure 35a	15	
325		

The very-high-voltage double extended P-MOSFET of Figure 35b	40	
3.2.5		
The lateral NPN bipolar transistor of Figure 36	-	15
The high-voltage vertical NPN bipolar transistor of Figure 37	-	40
The high-voltage vertical PNP bipolar transistor of Figure 38	-	55
The very-high-gain vertical NPN bipolar transistor of Figure 39	-	
3.3		
The high-voltage N-JFET of Figure 40	600	600
The very high-voltage LIGBT of Figure 41a	15	600
The very high-voltage LIGBT of Figure 41b	40	600

Figure 43

Junction	Typical Sheet Resistance	Typical Breakdown Voltage
P+ / N-Well	65 Ohms/sq.	20 Volts
N+ / P-Substrate	50 Ohms/sq.	25 Volts
P-Top / N-Well	14 kOhms/sq.	40 Volts
P-Base / N-Well	1.75 kOhms/sq.	45 Volts
N-Ext. / P-Substrate	4 kOhms/sq.	45 Volts
N-Well / P-Substrate	1.5 kOhms/sq.	150 Volts
N-Well / P-Top / P-Substrate (RESURF)	-	650 Volts